

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
15 January 2004 (15.01.2004)

PCT

(10) International Publication Number  
**WO 2004/004664 A3**

- (51) International Patent Classification<sup>7</sup>: **A61K 38/00**, 38/16, 38/24
- (21) International Application Number: PCT/US2003/021828
- (22) International Filing Date: 8 July 2003 (08.07.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
10/192,448 10 July 2002 (10.07.2002) US
- (63) Related by continuation (CON) or continuation-in-part (CIP) to earlier application:  
US 10/192,448 (CIP)  
Filed on 10 July 2002 (10.07.2002)
- (71) Applicant (for all designated States except US): **DUKE UNIVERSITY** [US/US]; Erwin Road, Durham, NC 27710 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **STAMLER, Jonathan, S.** [US/US]; 101 Juniper Place, Chapel Hill, NC 27514 (US).
- (74) Agent: **ELRIFI, Ivor, R.**; Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C., One Financial Center, Boston, MA 02111 (US).
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:**  
— with international search report  
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report:  
29 July 2004
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: METHODS FOR TREATING OR PREVENTING ISCHEMIC INJURY

(57) Abstract: A therapeutic or prophylactic treatment method of myocardial ischemia, such as due to myocardial infarction, by administering erythropoietin, alone or in combination with other drugs, to a patient suffering from or at risk of cardiac injury, such as myocardial ischemia. The erythropoietin is administered in a concentration such that the subject's hematocrit level or production of red blood cells is not significantly affected.



WO 2004/004664 A3

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/21828

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A61K 38/00, 38/16, 38/24

US CL : 514/12, 2, 8; 424/85.1, 499; 530/395, 399

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 514/12, 2, 8; 424/85.1, 499; 530/395, 399

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
Please See Continuation Sheet

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,274,158 B1 (ZAHARIA CZEIZLER) 14 August 2001, cols. 2-8, claims 1-10, 12 and 16.	1-16
X	BESARAB et al. The Effects of Normal as Compared With Low Hematocrit Values in Patients With Cardiac Disease Who are Receiving Hemodialysis and Epoetin. The New England Journal of Medicine. August 1998, Vol. 339, No. 9, pages 584-590, especially pages 584-585, Figure 1 and Table 1 and page 589.	1-3, 6-11 and 14-16

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 15 January 2004 (15.01.2004)	Date of mailing of the international search report 02.11.2004
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703)305-3230	Authorized officer Abdel A. Mohamed Telephone No. (571) 272-1600

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/21828

## Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claim Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claim Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:  
Please See Extra Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-16

Remark on Protest

☐  
☐

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

**INTERNATIONAL SEARCH REPORT**

PCT/US03/00003

**Continuation of B. FIELDS SEARCHED Item 3:**

APS, CAS, ONLINE , DIALOG, MEDLINE, EMBASE, WPIDS

search terms: erythropoietin? treat? or therapeut? or ameliorat? or suppress? or prevent? hypoxia? ischemia? hemotocrit? red blood cell or RBC or erythrocyt? myocard? oxidat? or nitrosat? stress?